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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/904,188	07/12/2001	Frank Werfel	87333.1900	1224

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EXAMINER

PEREZ, GUILLERMO

ART UNIT	PAPER NUMBER
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2834

DATE MAILED: 11/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/904,188

Applicant(s)

WERFEL ET AL.

Examiner

Guillermo Perez

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

Acknowledgment is made of applicant's claim for foreign priority based on applications filed in Germany on July 13, 2000 and April 25, 2001. It is noted, however, that applicant has not filed a certified copy of the German applications as required by 35 U.S.C. 119(b).

Claim Objections

Claims 3, 8, and 10 are objected to because of the following informalities:

claim 3 recites "angel" in line 2, it should read ---angle---;

claim 8 recites "begin" in line 8, it should read ---being---;

claim 10 recites "r" at the end of the claim, it should include a period ---.---.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-5, 7, 11-13, 18-19, and 24-26 are rejected under 35

U.S.C. 102(b) as being anticipated by Fukuyama et al. (U. S. Pat.
5,341,059).

Referring to claim 1, Fukuyama et al. disclose a centrifuge comprising:

a rotor assembly (25) rotatable about a rotor axis, the rotor assembly (25) being configured to hold materials for separation;

a first superconducting magnetic bearing (27) comprising:

a first permanent magnet configuration (26) coupled with the rotor (25) assembly so as to rotate concurrently with the rotor assembly (25); and

a passive first superconducting magnet stator (27) being spaced apart from the first permanent magnetic configuration (26) and the rotor assembly (25), the first superconducting magnet stator (27) and first permanent magnet configuration (26) being sufficiently close together to produce a magnetic field interaction therebetween; and

a motor (53) coupled with the rotor assembly (25) for selectively rotating the rotor assembly (25).

Referring to claim 2, Fukuyama et al. disclose that the magnet field lines of the first permanent magnet configuration (26) penetrate approximately perpendicular into at least one surface of the first superconducting magnet stator (27).

Referring to claim 3, Fukuyama et al. disclose that the position of rotor axis includes an angel from 0 to 90 degrees relative to a horizontal plane.

Referring to claim 4, Fukuyama et al. disclose that the first permanent magnet configuration (26) comprises at least one permanent magnet ring or a permanent magnet cylinder, the first superconducting magnet stator (27) being at least partially disposed in radial alignment with the first permanent magnet configuration (26).

Referring to claim 5, Fukuyama et al. disclose that the first superconducting magnet stator (27) at least partially surrounds the first permanent magnet configuration (26).

Referring to claim 7, Fukuyama et al. disclose that the rotor assembly (25) comprises a rotor mounted on a drive shaft (25); and

the first permanent magnet configuration (26) comprises a plurality of discrete permanent magnets, each permanent magnet being disposed at a discrete location along the length of the drive shaft, the first superconducting magnet stator encircling the drive shaft.

Referring to claim 11, Fukuyama et al. disclose that the first superconducting magnet stator (27) is connected to a cryogenic unit configured to cool the first superconducting magnet stator (27).

Referring to claim 12, Fukuyama et al. disclose that the first superconducting magnet stator (27) is coupled directly to an in-housing integrated cryogenic unit to cool down the first superconducting magnet stator (27) to below the critical temperature and to maintain the superconducting state.

Referring to claim 13, Fukuyama et al. disclose that the first superconducting magnet stator (27) has a substantially solid or hollow cylindrical configuration.

Referring to claim 18, Fukuyama et al. disclose that the first superconducting magnet stator (27) has the geometry of a ring or hollow cylinder.

Referring to claim 19, Fukuyama et al. disclose that the first permanent magnet configuration (26) comprises at least one permanent magnet a substantially ring or

cylinder like configuration, the permanent magnet being mounted coaxially about the rotor axis.

Referring to claim 24, Fukuyama et al. disclose that the first permanent magnet configuration (26) comprises a single ring or cylinder like permanent magnet.

Referring to claim 25, Fukuyama et al. disclose a second superconducting magnetic bearing spaced apart from the first superconducting magnetic bearing, the second superconducting magnetic bearing comprising: a second permanent magnet configuration coupled with the rotor assembly so as to rotate concurrently with the rotor assembly; and a passive second superconducting magnet stator being spaced apart from the second permanent magnetic configuration and the rotor assembly, the second superconducting magnet stator and first permanent magnet configuration being sufficiently close together to produce a magnetic field therebetween.

Referring to claim 26, Fukuyama et al. disclose a centrifuge with a rotor unit to process and separate different dense materials has least one bearing and is combined with a driving device rotatable around the rotor axis, wherein

at least one part of the rotor unit is influenced by magnetic forces and is characterized in that the rotor arrangement comprises at least one permanent magnet configuration (26) which interacts at given small distance with at least one adjacent superconducting magnet stator (27) wherein the permanent magnet configuration (26) and the magnet stator (27) comprise at least one passive superconducting magnetic bearing.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 6, 8, and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuyama et al. in view of Andrey (U. S. Pat. 5,723,931).

Fukuyama et al. substantially teaches the claimed invention except that it does not show that the first permanent magnet configuration at least partially surrounds the first superconducting magnet stator. Fukuyama et al. do not disclose that each permanent magnet is disposed at a discrete location on the inside face of the cylindrical housing along the length thereof. Fukuyama et al. do not disclose that at least a portion of the first superconducting magnet stator is disposed within the cylindrical housing. Fukuyama et al. do not disclose that the melt textured YBCO superconducting material is of the composition $Y_{1.3-1.7}Ba_2Cu_3O_{7-\delta}$. Fukuyama et al. do not disclose that the first superconducting magnet stator comprises a melt textured multi-grain material of high mechanical stability configured to produce damping properties of the magnetic bearing.

Andrey discloses that the first permanent magnet configuration at least partially surrounds the first superconducting magnet stator. Andrey discloses that each permanent magnet is disposed at a discrete location on the inside face of the cylindrical housing along the length thereof. Andrey discloses that at least a portion of the first

superconducting magnet stator is disposed within the cylindrical housing (figures 16-19). Andrey's invention has the purpose of demonstrating the feasibility of constructing the machine as an inner rotor or outer rotor type and still be capable of performing the electromagnetic functions of the machine.

It would have been obvious at the time the invention was made to modify the machine of Fukuyama et al. and provide it with the rotor, magnets, and stator configuration disclosed by Andrey for the purpose of facilitating the use of the machine in alternate working environments.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the specified materials since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

3. Claims 10, and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuyama et al. in view of Takahata et al. (U. S. Pat. 5,330,967).

Fukuyama et al. substantially teaches the claimed invention except that it does not show that the first permanent magnet configuration comprises a first permanent magnet concentrically disposed within a second permanent magnet. Fukuyama et al. do not disclose that the first permanent magnet configuration comprises at least two annular permanent magnets mounted concentrically one in another in a plane whereby the rings are radially adjacent fitted. Fukuyama et al. do not disclose that in the radial

direction the upper surfaces of neighboring rings show equal or alternating axial magnetization.

Takahata et al. disclose that the first permanent magnet configuration comprises a first permanent magnet concentrically disposed within a second permanent magnet (figure 3). Takahata et al. disclose that the first permanent magnet configuration comprises at least two annular permanent magnets mounted concentrically one in another in a plane whereby the rings are radially adjacent fitted (figure 3). Takahata et al. disclose that in the radial direction the upper surfaces of neighboring rings show equal or alternating axial magnetization. The invention of Takahata et al. has the purpose of facilitating the design and manufacture of the superconducting magnetic bearing.

It would have been obvious at the time the invention was made to modify the machine of Fukuyama et al. and provide it with the permanent magnets configurations disclosed by Takahata et al. for the purpose of facilitating the design and manufacture of the superconducting magnetic bearing.

4. Claims 9, 17, 20, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuyama et al. in view of Klein et al. (U. S. Pat. 3,747,998).

Fukuyama et al. substantially teaches the claimed invention except that it does not show a collector ring disc disposed between each of the permanent magnets. Fukuyama et al. do not disclose a damping disc interposed between the first and second superconducting magnet stator, the damping disc being formed from copper,

aluminum or their basic alloys. Fukuyama et al. do not disclose that the first permanent magnet configuration comprises a plurality of axial magnetized rings stacked axially with adjacent equal polarities and comprising a high radial magnetic flux density. Fukuyama et al. do not disclose that the first permanent magnet configuration comprises an integrated lower part of the rotor cup.

Klein et al. disclose a collector ring disc (17) disposed between each of the permanent magnets (20,21). Klein et al. disclose a damping disc (17) interposed between the first and second superconducting magnet stator (21). Klein et al. disclose that the first permanent magnet (20) configuration comprises a plurality of axial magnetized rings (20) stacked axially with adjacent equal polarities and comprising a high radial magnetic flux density. Klein et al. disclose that the first permanent magnet configuration (20) comprises an integrated lower part of the rotor cup (6). The invention of Klein et al. has the purpose of resisting the high centrifugal forces to which the magnets and the rings are subjected.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the machine of Fukuyama et al. and provide it with the collector ring disc, the damping disc, and the permanent magnet configuration disclosed by Klein et al. for the purpose of resisting the high centrifugal forces to which the rotor is subjected.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the damping disc from copper, aluminum or their basic alloys since it has been held to be within the general skill of a worker in the art to select

a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuyama et al. in view of Andrey as applied to claim 15 above, and further in view of Klein et al.

Fukuyama et al. and Andrey substantially teaches the claimed invention except that it does not show that the first superconducting magnet stator comprises a ring-shaped damping discs made from copper, aluminum or their basic alloys.

Klein et al. disclose that the first superconducting magnet stator comprises a ring-shaped damping discs (17). The invention of Klein et al. has the purpose of resisting the high centrifugal forces to which the magnets and the rings are subjected.

It would have been obvious at the time the invention was made to modify the machine of Fukuyama et al. and Andrey and provide it with the ring-shaped damping discs disclosed by Klein et al. for the purpose of resisting the high centrifugal forces to which the rotor is subjected.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the damping disc from copper, aluminum or their basic alloys since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

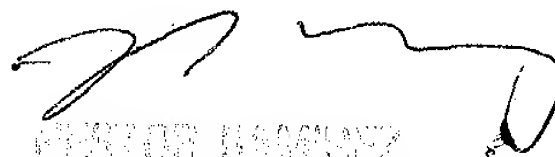
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Guillermo Perez whose telephone number is (703) 306-5443. The examiner can normally be reached on Monday through Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308 1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305 3432 for regular communications and (703) 305 3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

Guillermo Perez
November 4, 2002


NESTOR RAMIREZ
SUPERVISORY PATENT EXAMINER
RECEIVED NOV 11 2002